An Economic Impact Analysis of ARRA Funding for the Moab UMTRA Project

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1 Introduction

1.1 Purpose of the Study

This study is part of a body of research being conducted by a consortium of state workforce agencies under a state labor market information improvement grant awarded by the Department of Labor's Employment and Training Administration (ETA). The American Recovery and Reinvestment Act (ARRA) of 2009 authorized grant funds to be administered by the ETA to state workforce agencies for the purpose of collecting, analyzing, and disseminating labor market information with regard to occupations within the energy efficiency and renewable energy industries. The Utah Department of Workforce Services is participating in this research effort as a member of The Rocky Mountain and Great Plains Consortium.

Measuring job creation resulting from ARRA funding directed toward green economic activities is the primary focus of this study. Specifically, this research examines the job creation associated with ARRA funding used for the acceleration of the Department of Energy's Moab Uranium Mill Tailings Remedial Action (UMTRA) Project. As the main goals of removing the uranium tailings and remediating vicinity areas are to reduce the harmful radiological effects on humans and wildlife and to prevent further contamination of the Colorado River, the jobs directly issuing from these activities are considered green jobs. In addition to measuring job creation, identifying industries where green job opportunities exist is another objective of this research. Most of the direct employment for this specific project would be broadly considered as occurring within the waste management and remediation services industry. However, the impact of the funding allocated to the Moab UMTRA Project is not restricted to only direct remedial activities. As the funds are spent, the economic impacts work their way across a large number of industries, stimulating employment for both green and non-green jobs. Measuring this indirect employment created by the ARRA funding is an additional aim of the present research.

1.2 An Overview of the Moab UMTRA Project

With the onset of the Cold War in the late 1940s, the United States had a strategic interest in developing a domestic supply of uranium for its nuclear weapons program. The Atomic Energy Commission was the only legal purchaser of uranium in the U.S. and the agency promoted domestic production by establishing minimum prices and creating other financial incentives (Ringholz, 1990). In 1952, Charlie Steen discovered a large uranium deposit southeast of Moab, Utah that earned him a fortune and subsequently initiated a "uranium boom" across the Colorado Plateau. Steen formed several separate companies to mine and process uranium and his Uranium Reduction Company constructed a processing mill three miles northwest of the city of Moab in 1956. The Moab mill was later sold to the Atlas Minerals Corporation in 1962. By the early 1980s, the decline in the price of uranium forced most uranium mining and

milling operations to close in the United States. Altas ceased operations in 1984. After more than 30 years of processing uranium at the site, the Moab mill left behind a legacy of 16 million tons of mill tailings stored in an unlined impoundment area.

Due to concerns over the risks of detrimental effects posed to humans and the environment by uranium mill tailings, the federal government enacted legislation to remediate inactive uranium processing sites. In 1978, the U.S. Congress passed the Uranium Mill Tailings Radiation Control Act (UMTRCA) requiring the cleanup of uranium processing mill sites and in 1983 the U.S. Environmental Protection Agency (EPA) developed regulations for protecting the public and environment from hazards associated with inactive uranium mills (Department of Energy, 2008). Responsibility for cleaning up the Moab UMTRA site was officially transferred to the U.S. Department of Energy (DOE) in 2001.

The potentially hazardous effects of the Moab tailings pile can be grouped broadly into two main concerns. First, the tailings pile is a source of gamma radiation, radon gas, and radioparticulates, exposure to which can potentially produce long-term health problems. While these risks were present before the initiation of the remediation process, the issue of radiological exposure is of even greater concern during remediation when airborne radioparticulates and radon gas can be generated that could drift into the nearby city of Moab (Ryan, 2006a). The second main concern is that the tailings pile has contaminated the ground water and contaminants have been draining into the Colorado River, a source of drinking water for some 30 million people (Fahys, 2010). Besides uranium and a variety of other contaminants found in the ground water, the greatest environmental concern is associated with the formation of two ammonia plumes underneath the tailings pile. Ammonia from one of the plumes has been seeping into the Colorado River and it poses a threat to native plants and several endangered fish species (Karp & Metzler, 2005).

In order to provide a sense of how close the Moab tailings pile is located to sensitive areas, Figure 1 shows the proximity of the site to the Colorado River and the city of Moab. The tailings pile is to the west of the Colorado River and sits nearly on the river's bank. The city of Moab is just barely discernable in the photo, lying across the river about three miles to the southeast of the site.

The two core activities of the Moab UMTRA Project are related to the previously mentioned environmental concerns: Disposing of the 16 million tons of uranium tailings and remediating the ground water. To accomplish the disposal of the tailings, special containers are filled with tailings, which are then carried by trucks and transferred to railroad cars. Trains move the tailings-filled containers to a disposal site at Crescent Junction, Utah, which is approximately 30 miles north of Moab (Ryan, 2007). At the Crescent Junction disposal site, 2,300 acres of land have been temporarily withdrawn from the public to provide room for construction-related activities, 500 acres of which will be permanently withdrawn for the disposal cell (Ryan, 2008). In addition to removing the tailings pile, contaminated soil from a small number of nearby residences and from areas in Arches National Park will be shipped to the dis-

Figure 1. The Moab UMTRA Cleanup Site. (Photo: Tom Till)

posal site (Ryan, 2006b). As for the ground water remediation, the process consists of extracting water from several wells and spraying it over the tailings pile to increase its evaporation rate. The uranium, ammonia, and other contaminants remaining after evaporation become part of the tailings pile that will be shipped to Crescent Junction for disposal.

The Moab UMTRA Project also involves other remediation-related activities besides disposing of tailings and remediating ground water. Monitoring of gamma radiation, radon gas, and radioparticulate levels in Moab and at the disposal site in Crescent Junction will be ongoing throughout the life of the project. A variety of activities are being carried out to restore the environment and protect wildlife, activities that include revegetating disturbed soils with native plants, relocating fish from an old storage pond to a new pond, installing water guzzlers to provide fresh water for wildlife, constructing raptor perches, and eliminating undesirable tamarisk plants (Ryan, 2006a, 2007).

The DOE's original estimate for the completion date of the Moab UMTRA Project was 2028, with the total cost of the project expected to fall between $844 million and $1.1 billion (Department of Energy, 2008, 2010b; O'Donoghue, 2009). The ARRA funds allocated to the project were intended to accelerate the completion of the project by three years, moving the new estimated completion date to 2025. Because this study is concerned with measuring only those economic events directly associated with ARRA funding, the primary goal is to estimate the employment, wages, and

output that are consequences of the acceleration above and beyond the originally-planned operating levels. The DOE has been careful to account for the amount of activities that are directly attributable to ARRA funding. The DOE (2010a) notes that as of August 11, 2010, 2 million tons of tailings were shipped to the disposal site and the agency estimates that 60 percent of those shipments resulted directly from ARRA funding. The acceleration has generally increased the scale of activity for virtually all tasks, such as shipping of tailings by train to Crescent Junction, quarrying of rocks at Fremont Junction for disposal cell covering, removing tamarisk, constructing the underpass of State Route 279, and remediating ground water (Ryan, 2009b, 2010). The estimation of the full economic impacts of the activities resulting directly from the ARRA-funded acceleration of the Moab UMTRA Project form the subject matter of this analysis.

2 Methodology and Data

2.1 Input-Output Analysis and Modeling Assumptions

The economic impacts of the ARRA funding for the Moab UMTRA Project are estimated using input-output analysis. The input-output modeling approach attempts to characterize an entire economic region at a very high level of detail. While it is notable that such models typically include hundreds of industries, the most important aspect of input-output modeling is that it attempts to carefully capture the interrelationships amongst all of the various industries, as well as the household and government sectors. Given an increase in demand for a particular good, firms within the industry respond by increasing production, which requires using larger quantities of productive inputs. These inputs are, at the same time, the outputs of firms in other industries. Therefore, an initial increase in demand in one sector creates a wave of subsequent demand changes across a number of other industrial sectors. The story, however, does not end here. In order to meet an increase in demand, firms will respond by hiring more workers, resulting in an increase in the total amount of wages paid. As labor income increases, households will spend a greater amount on a variety of consumption goods, thereby creating another wave of demand changes across a large number of industries. By giving explicit consideration to the interrelationships throughout the economy, input-output analysis seeks to estimate the total economy-wide effects of a particular economic event, which are usually significantly larger than the effects for the initial industrial sector taken in isolation.

Input-output analysis typically decomposes the total effects of an economic event into three separate types of effects. The changes in employment, output, labor income, and other economic measures that occur strictly within the industry experiencing an initial change in the demand for its output are referred to as the direct effects of the economic event. All of the changes in employment, output, and other economic variables occurring as responses by firms to demand shifts for their products resulting

from the initial change in demand are called the indirect effects. The third type, induced effects, refers to the economic impacts resulting from changes in household income, which is determined primarily by labor income and proprietor income. As household income changes, primarily through changes in labor income and proprietor income, demand for final goods and services across a large number of industries will change depending on estimated household spending patterns.

The direct effects of an economic event are generally of less interest in input-output analysis than the indirect and induced effects. If demand for some good changes by a known amount, deriving an accurate estimate of the direct effects without reliance on an input-output model may be relatively straightforward. However, estimating the indirect and induced effects is a much more complicated endeavor. The greatest value of the input-output approach to economic analysis, it might be argued, rests in its ability to produce estimates of the indirect and induced effects of an economic event.

The input-output analysis was conducted using the IMPLAN economic impact modeling system (Minnesota IMPLAN Group, 2007). The present analysis used IMPLAN Version 3 software based on 2008 economic data for the State of Utah.

Several assumptions were made regarding the structure of the model and the data used. Some of these assumptions involve adjustments to the preset parameter values of the input-output model. Other assumptions pertain to the organization of the data and its incorporation into the model. The assumptions are here made explicit in order to facilitate an accurate interpretation of the results.

The first set of assumptions concerns adjustments for inflation. The IMPLAN system incorporates a GDP deflator and an output deflator to adjust for inflation when an event takes place in a year other than the base year, where the base year, in this case, is 2008. As of the fourth quarter of 2010, the majority of the funding for the Moab UMTRA project was received in the second half of 2009 and the first half of 2010. Under normal economic circumstances, the software's preset deflator values could be used to provide reasonable inflationary adjustments to income and output values. However, the period from 2008 through 2010 does not represent a time of normal economic conditions. In particular, the change in inflation from 2008 to 2010 was close to zero. The Bureau of Labor Statistics (BLS) reports that the Consumer Price Index increased by only 0.7 percent from 2008 to 2010 for the region under consideration.[1] On the production side, an examination of the BLS's Producer Price Indexes reveals that output prices were, on the whole, unchanged between 2008 and 2010.[2] Given that prices were essentially unchanged during this period, the GDP deflator and all output deflators were set to zero. Therefore, all of the results in this study can be viewed as being expressed in 2008 dollars, which, by the arguments given above, are roughly equivalent to 2010 dollars.

[1]The measure of the Consumer Price Index used was that for all urban consumer in the west urban area using all items from 2008 to 2010.

[2]Both commodity and industry measures were taken into consideration.

Another assumption concerned the choice of the region upon which to construct the input-output model. One possible approach is to include only Grand County on the basis that all of the core activities of the remediation project are taking place in that county. However, many firms from a number of counties in Utah have been contracted to work on the project and a portion of the monetary flows associated with these activities will undoubtedly return to the counties where the firms are located. A second possibility is to construct a region including only those counties where firms contracted to work on the project reside. Still, some economic impacts might be overlooked, such as spending flows to counties beyond the defined region that still occur within the state. Based on these considerations, the approach taken for this study was to construct a model based on the entire State of Utah. This assumption ensures that the results reflect the most complete assessment of the economic impacts possible.

The remaining assumptions are related to the data and the way in which funding is allocated across industries within the model. These assumptions are addressed in the following section.

2.2 ARRA Funding for the Moab UMTRA Project

The primary data source used for the estimation of the economic impacts is the recipient reported state summary data for the State of Utah from the Recovery.gov website. The data available at the website is presented as a cumulative total of ARRA funds received by firms and institutions in Utah through the most recent quarter. The present analysis is based on cumulative data through the fourth quarter of 2010.

The total amount of ARRA funding awarded to the Moab UMTRA Project is presented in Table 1. Just over 96 percent of the total funds were awarded to EnergySolutions, a nuclear waste remediation company headquartered in Salt Lake City. The remaining portion was awarded to S&K Aerospace, Inc., a company tasked with providing a variety of support activities for the project (Ryan, 2007).

Several assumptions made regarding the data and the entry of the data into the model deserve mention. The modeling was based only on funding that was received through the fourth quarter of 2010, not the total amount awarded. This implies that the focus of this analysis is on the economic impacts that should have, in fact, occurred

Table 1. Total ARRA Funding for the Moab UMTRA Project.

Award Key	Project Description	Award Amount
30581	Acceleration of the Moab UMTRA Project	$\$104,905,000$
34323	Support and Training for the Moab UMTRA Project	$\$3,445,000$

Table 2. ARRA Funding Received Through 4th Quarter, 2010.

Location of Recipients	Amount Received
Local Recipients	$47,833,619
Non-Local Recipients	$26,694,969
All Recipients	$74,528,588

as a result of funds actually received rather than on a hypothetical outcome that has not yet occurred. One advantage in modeling the impacts based on funding actually received is that the predicted and actual direct economic impacts can be compared, if estimates of the actual direct impacts are available. Direct employment impacts have been reported and a comparison between predicted and actual employment effects is considered in Section 3.

In order to properly estimate the size of the economic impacts, it is important to consider the timing of the receipt of funds. The IMPLAN system is based on annual data and, as a result, produces annual estimates. An examination of the data in the recipient reported state summary file for Utah revealed that nearly all of the funds received in connection with the Moab UMTRA Project were indicated as being received within the second quarter of 2009 and the first quarter of 2010. Therefore, it seemed reasonable to interpret the resulting impacts as annual estimates.

As the aim of this study is to estimate the economic impacts of ARRA funding for the Moab UMTRA Project in Utah alone, funds received by firms not located in Utah were excluded from consideration. As Table 2 indicates, approximately $74.5 million of the total funds awarded had been received as of the fourth quarter of 2010. Of this amount, roughly $47.8 million was received by firms located within Utah, with the remainder going to firms outside of the state. The economic impact estimates in this study are based solely on the amount of $47.8 million received locally.

A final data-related assumption deserving mention involves the entry of the data into the IMPLAN system. One approach to estimating the economic impacts of the ARRA funding is to simply take the entire amounts received to date and enter them into the industrial sectors corresponding to the two primary recipients: EnergySolutions and S&K Aerospace. However, this simplistic approach would likely produce inaccurate estimates. The entry of these amounts as lump sums into at most two sectors would ignore the unique nature of this project as well as the special characteristics of these particular firms. As a consequence, the results would largely reflect the historical average effects of the industries. The approach taken in this study was to allocate funding to industries at the most detailed level afforded by the available data.

The detailed allocation of funding by industrial sector is based on the local sub-awards data found in the recipient reported state summary data. In order to verify the industrial distribution of funding as found in the sub-award data, representatives

Table 3. Distribution of ARRA Funding by Industry.

IMPLAN Sector	NAICS Sector	Description of Sector	Percent of Spending
36	236, 237 and 238	Construction of Other New Non-Residential Structures	43.44%
186	332312	Plate Work and Fabricated Structural Products Manufacturing	0.54%
319	423810 424710	Wholesale Trade	0.24%
320	441320	Retail - Motor Vehicles and Parts	0.21%
333	482111	Rail Transportation	35.78%
369	541330	Architectural, Engineering, and Related Services	0.11%
374	541611	Management, Scientific, and Technical Consulting Services	2.56%
382	561320	Employment Services	0.12%
388	561730	Services to Buildings and Dwellings	0.91%
390	562211 562991	Waste Management and Remediation Services	16.07%

of the Moab UMTRA Project were contacted and they confirmed that the sub-award data accurately represents the allocation of funding across industries. As for the difference between the total funding received and the amounts distributed as sub-awards, the amount was entered into the IMPLAN sector 390, which corresponds to the NAICS code for EnergySolutions. This residual amount was also confirmed by project representatives as being a reasonably accurate estimate of the amount retained by EnergySolutions. The industrial allocation of funding based on the sub-award data is given in percentage terms in Table 3. The data are presumed to be sufficiently detailed to capture the unique features of this particular project when calculating the estimates.

The two industries that stand out in Table 3 are construction and rail transportation. Together they received nearly 80 percent of all funding. Among the construction-related activities associated with this funding are the construction of the underpass of State Route 279, the preparation of the disposal cell in Crescent Junction, the creation of access roads, and the construction of the Support Area

where tailings containers are loaded and unloaded (Ryan, 2009a, 2010). Funding in the rail transportation industry reflects not only the increased number of trains shipping tailings to the disposal cell, but additional activities including the lowering of the grade along the route and replacing the track, constructing a new rail spur at the loading area, adding new track at the Crescent Junction site, and replacing 15,000 ties by the Union Pacific Railroad (Ryan 2009a). Besides the waste management and remediation services industry, which received the third largest share of funding, the remaining industries received comparatively small percentages of funding through sub-awards.

3 Results of the Economic Impact Analysis

A summary of the estimated economic impacts is provided in Table 4. The direct effects can be interpreted as increases to employment, wages, value added, and output arising from those firms that directly received awards or sub-awards in association with the Moab UMTRA Project. The direct employment effect should be approximately equal to the number of workers actually involved in the day-to-day operations of the project over a one-year period.

Even though it was previously mentioned that the present analysis is restricted to funding recipients located in Utah, it is worth emphasizing that most of these firms are not located in either the city of Moab or Grand County. For example, most of the construction-related funding has gone to Nielson Construction, which is located in the city of Huntington in Emery County. In fact, firms from eight different counties in Utah were recipients of ARRA funding for the Moab UMTRA Project. The importance of this point is that the indirect and induced economic impacts will tend be spread across the entire State of Utah rather than occurring all within Grand County.

The model predicted that the indirect and induced economic effects led to the creation of an additional 345 jobs throughout the state. Furthermore, the indirect and induced effects constituted roughly half of the total effects measured in terms of wages, value added, and output. The model also estimated that the average annual wage for all employment resulting from the ARRA funding was approximately $46,000, which

Table 4. Summary of the Economic Impact Analysis.

Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	264	$14,790,669	$22,480,449	$47,657,866
Indirect Effect	159	$7,162,881	$10,608,324	$20,833,296
Induced Effect	185	$6,087,825	$11,144,830	$19,934,748
Total Effect	609	$28,041,375	$44,233,603	$88,425,910

Table 5. Top Ten Affected Industries Ranked by Employment Impact.

IMPLAN Sector	Description	Employment	Labor Income	Value Added	Output
36	Construction of Other Non-Res.	161	$7,334,465	$7,761,011	$20,777,004
390	Waste Mgmt/ Remediation Svcs	44	$2,557,165	$4,092,967	$8,747,903
333	Rail Transportation	44	$4,361,975	$10,158,310	$17,269,694
413	Food Services/ Drinking Places	26	$440,209	$646,589	$1,335,154
369	Architectural/ Engineering Svcs	21	$1,249,554	$1,267,389	$2,381,146
360	Real Estate Establishments	20	$338,343	$1,603,480	$2,032,301
388	Services to Bldgs/Dwellings	16	$346,360	$424,916	$814,367
382	Employment Services	14	$322,875	$347,733	$467,331
319	Wholesale Trade	13	$799,071	$1,373,258	$2,135,063
374	Mgmt, Scientific and Tech Svcs	13	$733,250	$841,264	$1,599,616
	All Other Industries	238	$9,558,108	$15,716,686	$30,866,332
	Total	609	$28,041,375	$44,233,603	$88,425,910

is considerably higher than Utah's average annual wage of $39,220 as reported in the BLS's Occupational Employment Statistics for May 2009.

The ten industries that experienced the greatest increases in employment are listed in Table 5. For each sector listed in this table, each quantity along the row represents the sum of the direct, indirect, and induced effects. The top three industries as measured in terms of employment are the same three industries that received the largest amounts of funding.

This analysis of the economic impacts of the ARRA funding for the Moab UMTRA Project is based on the amount of funds actually received rather than on the total amount of funds awarded. The advantage of choosing this approach to modeling the economic impacts is that it allows for a comparison between the predicted effects of the model and the actual effects. If the reported direct effects can be taken as accurate, the model can be evaluated comparatively. Direct employment figures have been reported for the project and they will serve as the basis of comparison.

Table 6. A Comparison of the Predicted and Adjusted Employment.

Impact Type	Predicted Employment	Adjusted Employment
Direct Effect	264	245
Indirect Effect	159	148
Induced Effect	185	171
Total Effect	609	564

The DOE initially predicted that the ARRA funds for the project would create and/or save 160 jobs (Department of Energy, 2009). However, by October 2010, the DOE reported that more than 200 jobs were created and/or saved (Department of Energy, 2010a). The number that is assumed to represent the actual number of jobs created comes from the recipient reported state summary data file. In the data file for the fourth quarter of 2010, EnergySolutions reported creating 239 jobs and S&K Aerospace reported creating approximately 6 jobs. Therefore, the most reasonable reported estimate of the number of actual jobs created by the ARRA funding for the Moab UMTRA Project is assumed to be 245.

The comparison between the actual and predicted employment impacts is presented in Table 6. The actual direct employment effect of 245 jobs is roughly 92.8 percent of the the model's predicted direct employment effect of 264 jobs. Therefore, the model can be viewed as producing a reasonably accurate prediction of the direct effects associated with the ARRA funding. The indirect and induced employment effects, however, cannot be compared because there were no reported data for these effects. While the direct employment effect under the adjusted employment column represents the actual reported direct employment, the indirect and induced effects under the adjusted employment column were estimated by multiplying the predicted employment figures and rounding them to the nearest natural number. For those who are reluctant to accept the predicted employment figures due to the discrepancy between the predicted direct employment of 264 and the actual direct employment of 245, the figures in the adjusted employment column can be taken as reasonable adjustments to the predicted effects, where the estimates are scaled down in proportion to the actual direct employment.

4 Conclusion

4.1 Summary of the Results

The estimates of the economic impacts in this study are based on $47.8 million of ARRA funding designated for the acceleration of the Moab UMTRA Project and received by firms operating within the State of Utah. This analysis estimates that

ARRA funding received through the fourth quarter of 2010 created 264 direct jobs and an additional 345 indirect and induced jobs across the state. These 609 jobs received approximately $28 million in total wages, or roughly $46,000 per worker. The increase in the value of total output associated with these funds is estimated at $88.4 million. The industries that experienced the greatest increases in both jobs and the value of output were construction, rail transportation, and waste management and remediation services.

4.2 The Future of the Moab UMTRA Project

As mentioned previously in this analysis, the DOE's original estimated completion date for the Moab UMTRA Project was 2028. The acceleration of the project made possible by the $108 million in ARRA funds is predicted to reduce the total completion time by three years, moving the estimated completion date to 2025 (Department of Energy, 2010b). A recently passed amendment to the National Defense Authorization Act for Fiscal Year 2008 now requires that the DOE finish the project by 2019 (H.R. 1585, 2007). Even though this amendment specifies a completion date for the project, whether the project is, in fact, completed by 2019 is contingent upon several factors.

The greatest potential obstacle to completing the Moab UMTRA Project by 2019 is inadequate funding. In the hope of maintaining sufficient funding to meet the new deadline, Representative Jim Matheson and eight other members of Congress sent a letter to Department of Energy Secretary Steven Chu to request additional funding in order to keep the project operating at an accelerated pace (Bigler, 2010; Fahys, 2010). Matheson is seeking between $50 and $70 million in additional funding for fiscal year 2012, which he believes will be sufficient to maintain the current level of activity at the site. Whether these funds will be forthcoming will depend ultimately upon budgetary decisions made by Congress and the DOE.

Other factors serve to make meeting the 2019 completion date difficult. Infrastructure capacity constraints, such as limited space for loading and offloading railcars, and potential shipment disruptions due to inclement weather or other unforeseen causes could delay the completion (Ryan, 2008).

Regarding future employment associated with the Moab UMTRA Project, the nature of the work will likely be different from what has been characterized in this analysis. Many aspects of the project involve one-time activities that will presumably not need to be reproduced in the future. These activities include the construction of the support area for loading containers, paving access roads, laying down new railroad tracks, and building the underpass of State Route 279, among others. Consequently, construction and railroad employment will likely constitute a smaller proportion of the total project-related employment in the future. Nevertheless, employment associated with ongoing activities such as filling and transporting containers, remediating ground water, restoring vegetation, and preparing the disposal cell at Crescent Junction could be sustained at levels higher than those estimated on the basis of the original

completion date of 2028. While it may not be reasonable to expect the same level of employment resulting from the ARRA stimulus funds to be sustained throughout the life of the Moab UMTRA Project, a level of employment higher than originally estimated based on the 2028 completion date will apparently be needed in order to meet the 2019 completion deadline.

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